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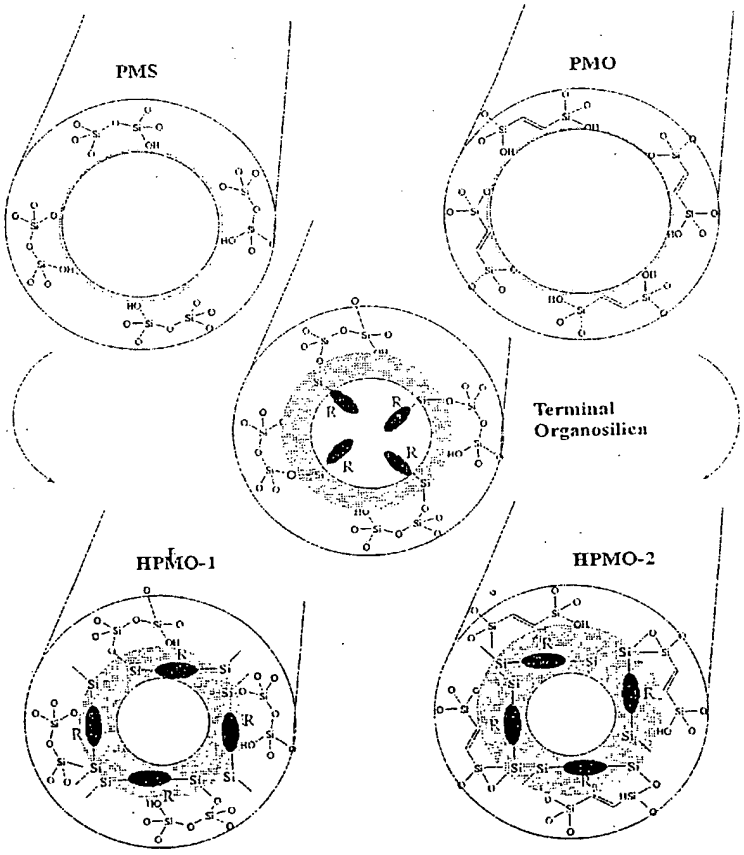

(57) Abstract: The present invention provides a synthetic strategy for creating a new class of materials called hybrid mesoporous, macroporous, or mesoporous-macroporous organometaloxide materials, exemplified but not limited to hybrid mesoporous organosilicas. This strategy involves taking a pre-assembled mesoporous material having a porous framework and then attaching an organic, inorganic or biological guest molecule to the pore walls of the framework material through two or more chemical linkages. The unusual combination of inorganic and organic components organized into a material with mesoscale porosity and having bridge bonded organic, organometallic, or biological functionalized surfaces suggests a myriad of uses for these composite materials, such as the controlled release and uptake of chemicals and drugs, chiral separations and catalysis, electronic printing and microelectronic packaging, thermal and acoustical insulation.

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